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Indian Standard

GLOSSARY OF TERMS RELATING TO FLOUR MILLING INDUSTRY

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GLOSSARY OF TERMS RELATING TO FLOUR MILLING INDUSTRY

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 5 October 1979, after the draft finalized by the Foodgrains and Foodgrain Products Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Various terms relating to flour milling are frequently being used by the industry. In order to have a uniform terminology and to give authoritative defiinitions of these terms, the Foodgrains and Foodgrain Products Sectional Committee decided to prepare this standard.

1. SCOPE

1.1 This standard defines the various terms frequently used in industries concerned with flour milling.

2. DEFINITIONS

2.1 Acetic Acid (CH_3COOH) — An organic acid, sour in taste, colourless, and with sharp odour; an active constituent of vinegar. Used in bread formula as mould/rope inhibitor.

2.2 Aeration — Air being forced through a stationary layer or column of grain for the removal of the end products of respiration and for cooling and drying.

2.3 Air Classification — A process which uses air currents in combination with centrifugal force, to effect the separation of flour particles into different ranges according to size and density.

2.4 Albumin — A class of protein that can be dissolved in pure water and is coagulable by heat and is also present in wheat flour.

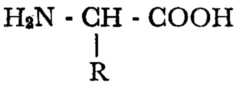
2.5 Alcoholic Acidity — The degree of acidity soluble in 90 percent (*v/v*) neutral alcohol expressed in terms of sulphuric acid. It is a test for degree of soundness of grain.

2.6 Aleurone Layer — A botanical term denoting the proteinaceous cellular layer which envelopes the endosperm and separates it from the bran or seed of the wheat kernel.

2.7 Alpha Amylase — An enzyme that develops in cereal grains during sprouting, which, in the presence of water converts starch molecules to sugar (maltose) units.

2.8 Alveograph — A dough testing instrument that measures the resistance to deformation and extensibility of a clamped disc-shaped piece of unleavened dough by forming a bubble, by means of air pressure applied from below the test piece, at a constant temperature.

2.9 Amino Acids — A group of nitrogenous organic compounds that serve as units of structure of the proteins and contained the chemical groups COOH (carboxyl) and — NH_2 (amine). The structure of a simple amino acid is as follows:



$$H_2N - \underset{\displaystyle R}{\underset{|}{CH}} - COOH$$

2.10 Amino Acids, Limiting — When the essential amino acid pattern of a food protein is compared to that of a standard reference protein such as that of whole egg, the essential amino acid which is in shortest supply relative to the reference protein is called the most limiting amino acid. The utilization of the protein depends on the amount of the most limiting amino acid.

2.11 Amylases — Enzymes which, in the presence of water, will convert large molecules of starch to sugar (maltose) units.

NOTE — The beta amylase can saccharify the amylase chain and terminal sugar groupings of the amylopectin. This will leave a residue termed dextrin of high molecular weight. The alpha amylase attacks more complex branch chain of amylopectin, and in doing so, releases the simple straight chain glucose groupings capable of being attacked by beta amylase. A purely beta amylase attack markedly reduces the viscosity of gelatinised starch, giving rise to dextrins of low molecular weight. Amylases in the baking industry are identified by their source as cereal of fungal amylase.

2.12 Amylograph — An instrument that measures the consistency or viscosity of a slurry of a starchy flour and water, when it is heated through a pre-determined cycle. The viscosity is measured by the resistance that the slurry offers to a mixing paddle. It is used to measure the alpha-amylase activity of the flours.

2.13 Amylopectin — It is a constituent of starch, consisting of highly branched 1 : 4 linked 50 000 to 500 000 glucose units. It gives a purple colour with iodine.

2.14 Amylose — It is a constituent of starch and consists of long unbranched chains of 500 to 5 000 glucose units (1 : 4 linkage). It gives a blue colour with iodine.

2.15 Analytical Test — A test based on the determination of the proportion of constituents in a mixture or a compound.

2.16 Ash Content — The amount of incombustible residue, left after incinerating a weighed amount of material and expressed as percentage.

2.17 Aspiration — Is a process of separation of particles of chaff, straw, small seeds, etc, from wheat, in the aspirator in which an air current is directed through a thin falling stream of stock.

2.18 ***ATTA*** — Whole wheat flour of 90-95 percent extraction rate.

2.19 Available Lysine — Lysine molecules in a polyeptide chain of proteins that remain unreacted with reducing sugars (glucose, lactose) and hence are available and utilizable. Those that react with reducing sugars form chemical bonds resistant to digestive enzymes and are unavailable to the body.

2.20 Baking Quality — The capacity of a flour to produce a baked product. Breadmaking quality refers to baking quality of flour used.

2.21 Benzoyl Peroxide ($C_6H_5CO_2$)$_2$$O_2$ — A chemical powder that is added to flour in small quantities for its beneficial bleaching action.

2.22 Bleaching Agent — A substance added to flour to bleach out the yellow pigment, naturally present in flour and thereby gives a whiter appearance to the flour and the bread produce from it, for example, benzoyl peroxide.

2.23 Blending Capacity — The ability or capacity of a flour to carry a proportion of low quality flour and still produce bread of satisfactory quality.

2.24 Blending of Wheat — The process of drawing measured amount of different lots from bins and mixing these parts into a uniform blend.

2.25 Bolting — Sifting of mill stocks (flour) by means of wire, silk or nylon covered sieves.

2.26 Bran — The outer most covering or seed coat of the wheat grain.

NOTE — Commercially, it is a by-product of the milling process consisting of the large pieces of bran remaining after the flour has been extracted from wheat.

2.27 Break Flour — Flour produced by the break rolls as the grain passes through the break system of the milling process.

2.28 Break Middlings — A mixture of particles of pure endosperm and endosperm with adhering bran produced by break rolls as the grain passes through the break system of the milling process.

2.29 Break Roll Mill — A mill equipped with a pair of corrugated rolls placed diagonally or horizontally in parallel alignment, rotating at differential speed towards each other.

2.30 Break System — The stage in the milling process where the grain is broken open and treated on successive rolls to separate the endosperm from the bran coat.

2.31 Brushing — A step in cleaning of wheat, where dust remaining after scouring is removed by action of brushes on the surface of grains.

2.32 Bulgur Wheat — A product of wheat obtained by parboiling.

2.33 Bushel Weight — The test weight in pounds of a measured bushel (64 pints - 36·37 litres) of grain. An important grading factor in most grain crops in Western countries.

2.34 Carotenes — An orange pigment in plants with isoprenoid structure which is converted in the body to vitamin A. The β-form is the most active precursor of vitamin A.

2.35 Cellulose — A polymer of glucose which is not digested by monogastric animals. Forms the supporting cell structure in plants. Chemically it is a B-D glucon composed of D-glucopyranose anhydride units linked by 4·1-B-D-glucosidic bonds.

2.36 Cereal Chemistry — The branch of science dealing with the composition and properties of foodgrains and foodgrain products.

2.37 Chlorine Dioxide (ClO_2) — A gaseous flour-improving agent which has both bleaching and maturing properties.

2.38 Clean Wheat — The wheat that has been run through a receiving separator for the removal of dockage and other extraneous materials such that it is fit for conditioning and milling.

2.39 Clothing — The term applied to any of the materials (silk, wire, nylon and other synthetics) used to sift and separate mill stocks by size.

2.40 Cockle — A round black seed requiring special cleaning equipment, for effecting its separation.

2.41 Composite Flour — A flour made by blending varying amounts of non-wheat flours with wheat flour and used for the production of baked goods that are traditionally made from wheat flour.

2.42 Conditioning — Adjustment of moisture content under controlled conditions, followed by a resting period to achieve a proper equilibrium of moisture through individual grains which toughens bran and mellows the endosperm, thereby improving the separation of endosperm from bran.

2.43 Crease — The lengthwise folded indentation characteristics of wheat kernels. Crease helps in identification of varieties.

2.44 Crude Fibre — General term for indigestible components of foods. It is the residue left after sequential extractions of a food with petroleum ether, 1·25 percent sulphuric acid and 1·25 percent sodium hydroxide. The ash content is deducted from above to obtain crude fibre.

2.45 Damaged Grain — Kernels or pieces of kernels that are sprouted or internally damaged as a result of heat, moisture, weather or microbes.

2.46 Damping — Addition of water for inducing optimum moisture for operation of milling process and for getting the desired moisture content of the final products.

2.47 Degradation — Breakdown of a large molecule of any substance into smaller fragments. Here it pertains to the breakdown of starch by amylases or proteins by proteoses.

2.48 Denaturation — Alteration in the configuration of protein molecules by physical or chemical methods.

2.49 Dextrin — An intermediate product formed in the degradation of starch by chemicals or by amylases.

2.50 Diastatic Activity — In flour quality evaluation, it is the measure of the activity of the starch degrading enzymes of the flour; it can be expressed in terms of the maltose (sugar) produced or in terms of the peak viscosity in the amylograph test.

2.51 Disc Separator — Particles longer or shorter than wheat grains but similar in diameter can be separated from wheat by means of indented discs with indents of pre-determined shape and size.

2.52 Dockage — The amount of foreign matter such as seeds, sand, straw and stones which may be readily removed by mechanical means from a sample of wheat.

2.53 Dough Expansion Test (Pelshenke) — The time that is required for a dough ball made from wheat meal, water and yeast and suspended in water at 30°C, to disintegrate. It is a rough measure of the quality of wheat protein for breadmaking and is used in screening for baking quality in new varieties of wheat during the early generations.

2.54 Durum Wheat — Hard wheat from *Triticum durum*, used for preparation of macaroni, spaghetti and semolina.

2.55 Dye Binding Capacity (DBC) — The capacity of basic imidazole, guanido and amino groups which occur in the polyeptide chain on histidine, arginine and lysine of a protein to bind to an acid azo dye (orange G). It is a measure of the quality or quantity of protein. Since the proportions of basic amino acids and terminal groups are reasonably constant in cereal proteins, the correlations between dye binding capacity and total protein content are high.

2.56 Endosperm — The starchy portion of the wheat grain which is ground into flour.

2.57 Enzyme — A protein that has the ability to speed up a biological reaction without itself undergoing any change, also known as biocatalyst.

2.58 Ergot — Black grain-like highly toxic fungal bodies, formed in the ear heads of cereals by different species of fungi belonging to genus *Claviceps*. The toxins are powerful alkaloids belonging to either clavine group (*BAJRA*) or ergatoxine eragoramine group (ray and wheat).

2.59 Essential Amino Acids — Those amino acids that cannot be synthesized (produced) by a living organism and therefore must be supplied by the food consumed.

2.60 Extenso Graph — An instrument for measuring the elastic and plastic properties of flour doughs. The instrument stretches a cylinder of dough (approx 4 × 15 cm) held by the two ends, by a hook engaging the dough piece in the middle and measures the resistance of the dough to extension. In some countries the instrument is used to measure the quality of wheat flour for breadmaking.

2.61 Extraction Rate — The proportion of milled product obtained from whole wheat grain during milling process, expresssed as percent by mass.

2.62 Falling Number (FN) — A test for measuring amylase activity. It is defined as the time in seconds required to stir and allow a viscometer stirrer to fall a fixed distance through a hot aqueous flour suspension being liquified by the enzyme in a standardized apparatus.

2.63 Falling Number Test — Test devised by Hagbarg for measuring alpha amylase activity in wheat and its products.

2.64 Farinograph — An instrument that mixes flour and water into a dough and produces a record of the resistance that the dough offers to the mixing blades. Used in evaluation of the breadmaking quality of flour.

2.65 Fat — A chemical constituent of plant or animal tissues, comprising esters of various fatty acids and glycerol (for glycerine). In cereal technology, it may refer to the natural flour fat or the fat (shortening) that is added in the bread formula.

2.66 Fatty Acids — Organic acids comprising of short or long chain of co-valently linked carbon atoms, bearing H atoms with a terminal carboxyl group.

2.67 Flour — Final ground meal of grains.

2.68 Flour Colour Gradation — The colour of flour determined by a special photo-electric instrument, as Kent Jones and Martin Colour Grader or Agtron Colour Instrument. Usually a measure of the branny contamination in flour and thereby milling efficiency.

2.69 Foreign Matter — Includes organic and inorganic matter. The inorganic matter shall include sand, gravel, dirt, pebbles, stones, lumps of earth, clay and mud. Organic matter shall include husk, chaff, straw, weed seeds and other inedible grains. Paddy shall be considered as foreign matter in commodities other than paddy.

2.70 Fortified *ATTA* — A product obtained by adding one or more permissible material like calcium carbonate, nutrients like iron, thiamine, riboflavin, niacin and amino acids, etc, to wheat *ATTA*.

2.71 Fructose — A monosaccharide sugar found in sweet fruits and in honey; also called as fruit sugar.

2.72 Fumigants — Fumigants are chemicals which, at a required temperature and pressure, can exist in the gaseous state in sufficient concentration to be lethal to a given pest organism.

2.73 Fumigation — Fumigation for pest control is a process of exposing pests or pest affected stocks to the fumes of chemicals at a lethal strength in gas tight space.

2.74 Gelatinization — The breakdown of the granular structure of starch as by heating starch slurry or a dough. The starch granules swell and subsequently burst. Gelatinization is important in relation to the development of crumb structure of bread.

2.75 Genetic — Pertaining to characters that are inherited.

2.76 Germ — The embryo in a cereal grain which grows into the new plant.

2.77 Gliadin — The fraction of wheat flour proteins that can be dissolved in a 70 percent solution of ethyl alcohol. It is also classified as prolamine. It provides elasticity to dough.

2.78 Globulin — The fraction of wheat flour protein that can be dissolved in dilute salt solution.

2.79 Glucose — A monosaccharide sugar, occuring naturally in some fruits. It is the sugar that is formed in the degradation of starch of flour by yeast enzymes.

2.80 Gluten — The rubber-like yellowish grey proteinaceous material that remains after the water solubles and starch are washed out of dough in a stream of water. Its content in flour is a measure of breadmaking quality. It is a mixture of two proteins gliadin and glutenin.

2.81 Gluten Swelling Test — A test for breadmaking quality which determines the volume of gluten swollen in a dilute solution of lactic acid, also known as Berliner test and is similar to the sedimentation test.

2.82 Glutenin — The fraction of wheat flour proteins that is insoluble in water, salt solution, or 70 percent ethyl alcohol solution, but soluble in dilute alkali. It provides strength to dough.

2.83 Grading — In terms of milling, it means the classification by sifting, prior to purification, of the endosperm particles emanating from the break system into a relatively narrow range of particle size.

2.84 Gradual Reduction — This is the process by which wheat is broken down to flour and by-products in several stages. This makes it possible to separate much of the bran before wheat is pulverized into flour particle size, resulting in a whiter flour with improved baking properties.

2.85 Granulation — The coarseness or fineness of a powder such as flour or sugar. In baking technology, it pertains to the particle size and size distribution of the flour.

2.86 Grist — The wheat mixture (may comprise of several different wheats) that is made up in the mill to produce a specific flour.

2.87 Grit Content — Grit in the form of small particles of stones, metal, coal, etc, present in semolina which may be detected by floatation of the semolina in carbon tetrachloride.

2.88 Hard Wheat — Wheat, which as a result of variety of breeding in combination with environmental factors during growth, has a vitreous endosperm, generally considered an advantage for the production of breadmaking flours, as the protein content is generally superior in quality and quantity.

2.89 Hectolitre Weight — Weight of 100 litres of the commodity determined on dockage free basis.

2.90 Hydration — The absorption or uptake of water by solid materials, for example, flour. In breadmaking, two aspects of hydration are important — the total amount absorbed (hydration capacity) by the flour and the rate at which it is absorbed (rate of hydration).

2.91 Hydrolysis — The degradation of large molecules, such as starch or proteins, into smaller fragments with the direct involvement of water in the process.

2.92 Impact Milling — The reduction in size of particles by flinging them at very high speed against a hard surface.

2.93 Improving Agent — Any substance that is added to flour or to dough to improve its performance during breadmaking and to improve the quality of the bread that can be produced from the flour, for example, potassium bromate, and ascorbic acid (vitamin C).

2.94 Inactivation (Enzyme) — The destruction of the natural catalytic activity of the enzyme by chemical or physical means.

2.95 Insect Damaged Grains — Kernels that are partially or wholly bored by insects.

2.96 Insecticides — These are chemicals which are used to kill or prevent infestation of insects/pests.

2.97 Insecticide Residues — A pesticide chemical, its derivatives and adjuvants in or on plant or animal. Insecticides may leave residues when used on foodstuffs for insect control. Residues are expressed as parts per million (ppm) based on fresh mass of the sample.

2.98 Invertase — An enzyme that converts sucrose into glucose and fructose.

2.99 Invert Sugar — A mixture of glucose and fructose which is obtained from hydrolysis of sucrose by enzymes or acids. It is laevo-rotatory.

2.100 Irradiated Wheat — A method mainly for controlling insect infestation in stored wheat, for example, wheat is exposed to gamma rays 60co with a maximum radiation dose of 100KRad and stored for 12 weeks after irradiation for usage.

2.101 Kernel — The body of a seed (for example wheat) within its husk.

2.102 Kernel Weight — A quality test applied to wheat to determine its potential milling value.

2.103 Kjeldahl Procedure — A procedure for determining the total nitrogen content in organic substances. Estimation is done by assuming the entire nitrogen to be present as protein. The amount of nitrogen is converted into protein content by multiplying by a constant factor (5·7 for wheat).

2.104 Lipids — Term used synonymously with fat but comprise heterogeneous group of substances like fatty acids, phosphatids, sterols and waxes.

2.105 Lipase — Enzymes that hydrolyse oils and fats to glycerol and fatty acid. Presence of lipase in some whole grain cereals can cause rancidity upon storage due to action of lipase on fats of grains.

2.106 Lysine — It is a basic amino acid which is essential in human nutrition and is found to be most limiting in cereal grains including wheat.

2.107 Magnetic Separator — Part of the grain cleaning section where metallic pieces are recovered from the grains by action of an electromagnet.

2.108 ***MAIDA*** — Term used in India for 70 percent extraction flour, consists mostly of endosperm.

2.109 Maltose — A disaccharide sugar obtained by the action of amylases or acids on starch. It comprises two glucose units and is the main fermentable sugar in dough.

2.110 Maltose Value — An index of diastatic activity of flour. It is measured as the number of milligrams of maltose produced from 10 g of flour under standardized conditions.

2.111 Malted Cereal Flour — Flour produced by grinding malted (sprouted or germinated and dried) wheat and barley and used as an adjunct to bread flour to improve its gassing power.

2.112 Maturing Agent — Any substance, usually a chemical (for example potassium bromate), that is added to flour or dough to improve the breadmaking quality of the flour.

2.113 Middlings — Particles of wheat endosperm extracted from the break system which have yet to be ground into flour. Also commercially, a by-product of milling, consisting mainly of the coarse material tailing over the end of the reduction system.

2.114 Middlings Rolls — A pair or pairs of smooth rolls used to reduce middlings in process, to flour particles size. Also called reduction rolls.

2.115 Milling Loss — The amount by which the weight of total products is less than the weight of raw wheat used. It is usually expressed as a percentage of raw wheat used.

2.116 Milling Quality — The measure of the ability of a wheat to produce a high yield of flour with required characteristic by a predetermined milling method.

2.117 Moisture — The water that is contained as a natural constituent of most food and other biological materials.

2.118 Mould — Fungi that reproduce by spores, for example, Aspergillus. Some species of the latter produce aflatoxin which is highly toxic.

2.119 Niacin — It is a vitamin of the B-complex group. Also known as nicotinic acid.

2.120 Offals — Term used in flour milling for bran and germ that are removed during milling of white flour.

2.121 Optimum — The best or most favourable degree, condition or amount in processing for the production of the best or highest quality product.

2.122 Oxidation — One of the many ways by which the handling properties of dough can be improved so as to improve the quality of bread. It is brought about by substances referred to as oxidants, improvers or maturing agents.

2.123 Patent Flour — The portion of a straight run flour, brighter in colour and with a lower ash content than the remainder of the flour. The first processes used to make such flour were patented, hence the name.

2.124 Pearling Index — Percentage of material pearled off from a sample of wheat of prescribed weight in a laboratory pearler operated for a prescribed period of time. It is an index of hardness of grain.

2.125 Pekar Test — A test of flour quality made by comparing the colour of flour against a standard sample. Such sample is placed side by side on a flat rectangular piece of wood, pressed down to a smooth surface and compared with the standard.

2.126 Pelshenke Value — It estimates the potential breadmaking strength of wheat. The time required for a small dough balls with yeast suspension, that are immersed in water at constant temperature, (30°C) to disintegrate, gives ' test number '. The number when divided by percent of protein in wheat gives the quality of gluten.

2.127 Pentosen — These are complex carbohydrates formed from pentoses (5 carbon sugars).

2.128 Pericarp — The outer layers of wheat and other grains consisting of fibrous material which is composed of cellulose, hemicellulose and a non-carbohydrate substance called lignin. The pericarp is rich in phytic acid (*see* **2.130**).

2.129 *p*H — The negative logarith of the hydrogen ion concentration of a solution or a mixture; a measure of acidity or alkalinity; acid below 7, alkaline above 7 and neutral at *p*H equal to 7.

2.130 Photometry — A technique commonly applied in analysis, for measurement of optical density of solution with the help of a photometer.

2.131 Phytic Acid — Chemically it is called inositol hexo-phosphoric acid. It is present mostly in the husk or pericarp of cereals. Has strong chelating effect on bivalent metal ions calcium, iron and zinc which when combined with it form insoluble salts that render these mineral nutrients unavailable to the body.

2.132 Plane Sifter — A sifting machine consisting of a number of superimposed sieves gyrating together in a horizontal plane, having a rotary motion.

2.133 Pigment — Any natural colouring matter in the cells and tissues of plants and animals. In wheat, the main interest is in the yellow pigments which are mainly carotenoids.

2.134 Pneumatic Conveying — The transporting of material in enclosed tubes using air under negative or positive pressure as the conveying medium.

2.135 Proteose — An enzyme (biological catalyst) that brings about a break down of proteins. In the baking industry, this enzyme from cereal or fungal sources is used to improve the handling properties of dough.

2.136 Protein — One of the important constituents of plant and animal tissues containing carbon, hydrogen, oxygen, nitrogen and frequently sulphur. In wheat, protein is important for baking and nutritional qualities.

2.137 Purifier — A machine with one to three layers or ducts of sieves set in an oscillating frame. It employs the principle of separation by size and density to separate a mixture of pure endosperm, composite pieces of endosperm and bran and branny material from each other.

2.138 Pyridoxine — It is member of the B-complex group of vitamins also known as vitamin B_6. Three forms are known, phyridoxine, pyridoxal phosphate and pyridoxamine.

2.139 ***RAVA*** — *SUJI* or *'RAVA'* are large particles of endosperm of low extraction rate, 60-65 percent, derived preferably from wheat.

2.140 Reconstitution — The blending or mixing together of original constituents in the same proportions as found in the original complex substance.

2.141 Reducing Sugars — Sugars that reduce Fehling's or Benedict's solutions, for example, glucose.

2.142 Reduction Rolls — *See* Middlings Rolls (**2.114**).

2.143 Resultant *ATTA* — A by-product of roller flour mills. After removal of *MAIDA*, *SUJI* and bran, the rest of the endosperm adhered with bran is ground to make resultant *ATTA*. This *ATTA* is quite different from whole meal *ATTA*.

2.144 Rheograph — An instrument that measures the machanical properties of dough.

2.145 Rheology — A science dealing with the deformation and flow of matter.

2.146 Roller Mill — A mechanism used to grind wheat into flour and by-products. It consists of one or more pairs of cylindrical rolls arranged with their axis parallel and set in a heavy frame. Rolls may be corrugated (break rolls) or smooth (reduction rolls).

2.147 Riboflavin — Vitamin B_2, part of flavoproteins which act as coenzymes in transfer of H in the oxidation chain.

2.148 Rounder — A mechanical device used in bakeries for rolling the dough piece into a ball.

2.149 Scouring — This is part of the cleaning section in the wheat mill where superficial dirt and loose shreds beeswing are removed by abrasion of wheat surface against perforated metal or emery lined cylinder and thereby blowing away the dirt by air current.

2.150 Screenings — Impurities of wheat removed from the grain in the wheat cleaning section.

2.151 Screens — Impurities, larger or smaller than wheat grains are removed by screens of perforated metal; the size and shape of the perforations being chosen in relation to the wheat grain also.

2.152 Sedimentation Test (Zeleny) — A wheat protein quality test (for breadmaking), in which the flour is suspended and allowed to swell in a solution of lactic acid. The volume of the sediment (in millilitres), consisting of swollen gluten and starch, after standing for predetermined period is the sedimentation value.

2.153 Semolina — Same as *RAVA*/*SUJI*

2.154 Shorts — A mixture of small pieces of bran and fibrous material remaining after the flour has been extracted from the wheat. It is a by-product used for animal feed.

2.155 Sick Wheat — Wheat in which the germ is discoloured and dead.

2.156 Soft Wheat — Wheat with white opaque endosperm and low gluten. Generally considered more suitable for production of cake and biscuit flour.

2.157 Solubility — The amount of a substance that dissolves in a particular solvent under controlled conditions (*p*H, temperature).

2.158 Spore Count — An examination made with microscope from which a calculated estimate of mould phase concentrate is made.

2.159 Spiral Trieur — A device used principally for separating raw seeds from fractioned or shrivelled wheat kernels. It consists of several spiral cannals wound concentrically round a vertical shaft.

2.160 Sprouted Grain — Grain which has begun to germinate causing changes in the maltose value which, in turn, reduces the milling value.

2.161 Starch — A major constituent of wheat flour containing carbon, hydrogen and oxygen.

2.162 Starch Damage — Disruption of the natural structure of the starch granules by biochemical (amylases), chemical (alkali) or physical (grinding or milling) measures.

2.163 Straight Run Flour — A grade of flour produced by combining together all the basic flour streams made in the mill.

2.164 Strength (Flour) — The capacity of a flour to produce well leavened leaves of large bold volume. A desirable characteristic of breadmaking flour.

2.165 Strong Flour — A flour that takes up a relatively large quantity of water and produces a dough that requires a relatively long mixing for proper development. Usually a flour of high quality for bread-making.

2.166 *SUJI* — Same as *RAVA*.

2.167 Supplement — An additive to flour or dough to improve the processing, eating or nutritional qualities.

2.168 Tail End — The final changes of the milling process where the last particles of flour are extracted.

2.169 Tails (Overtails) — The material that is discharged over the end of a sieve.

2.170 Tempering — A process less elaborate than conditioning which produces desired physical changes, resulting in optimum milling in wheat by means of (1) water additions (2) time for penetration.

2.171 Thiamine — Also called vitamin B_1 or anti-beri-beri factor. Part of enzyme thiamine pyrophosphate TPP which decarboxylates pyruvic acid in carbohydrate metabolism.

2.172 Triticale — It is an artificial genus synthesized by combining genomes of wheat (genus Triticum) and rye (genus Secale). Potential substitutes for wheat grains with better protein content and quality. They are still under experimentation for breeding and nutritional quality.

2.173 Tyrosinase — Enzyme that oxidises tyrosine and other phenolic substances forming brown and black pigments.

2.174 Uric Acid — End product of nitrogen metabolism in insects; indicates insect activity in flour. The true 'Uric acid' content in flour for human consumption should not exceed 10 mg/100 mg.

2.175 Variety — A group of strains or a single strain which, by its structural or functional characters, can be differentiated from another group. In plant breeding, usually a strain that has been adopted or licenced for commercial production.

2.176 Viscosity Test — A test based on the determination of the viscosity (thickness, consistency, resistance to flour) of a mixture or a solution of a substance and water. In flour testing, sometimes used as a measure of baking quality.

2.177 Water Absorption Power — The amount of water absorbed and retained, expressed as percentage, based on flour mass, which is required to produce a proper dough.

2.178 Weak Flour — A flour that takes up a relatively small quantity of water and produces a dough that requires a relatively short mixing for development. Usually a flour of low quality for breadmaking.

2.179 Wheat Selection — In wheat breeding, the sorting out or retention of wheat with the desired quality characteristics. In commercial operations, the sorting out and retention of wheat suitable for the desired end products.

2.180 Whitening Agents — Chemical agents which bleach and whiten the wheat flour for making white bread.

2.181 Whole Meal *ATTA* — Flour or meal of 100 percent extraction rate prepared by grinding whole wheat grains to fine powder.

2.182 Whizzer — A machine which removes surface wheat from grain after washing by centrifugal force.

2.183 Yellow Pigment — The natural yellow pigment in flour is mainly xanthophyll. It detracts from the desirable white colour and is usually bleached by chemicals such as benzoyl peroxide.

2.184 Zeleny Test — *See* Sedimentation Test (**2.152**).

INDAN STANDARDS
ON
FOODGRAINS AND FOODGRAIN PRODUCTS

IS :	
1009-1979	*MAIDA* for general purposes (*second revision*)
1010-1968	*SUJI* or *RAVA* (semolina) (*first revision*)
1155-1968	Wheat *ATTA* (*second revision*)
1156-1957	Pearl barley
1157-1957	Barley powder
1158-1973	Corn flakes
1484-1974	Rolled oats (quick-cooking type) (*first revision*)
1485-1976	Macaroni, spaghetti and vermicelli (*first revision*)
2234-1962	*IDLI* mix
2400-1976	*BESAN* (*first revision*)
2404-1972	Malt extract (*first revision*)
2639-1972	*PAPAD* (*first revision*)
2813-1970	Terminology for foodgrains (*first revision*)
2814-1978	Method for sampling of cereals and pulses (*first revision*)
2815-1964	Slotted tube sampler
2816-1964	Grain sampler (*PARKHI* type)
2821-1964	Thermo-sampler
3714-1978	Method for sampling of bigger size foodgrains (*first revision*)
3729-1966	Corn sampler (*PARKHI* type)
4333	Method of analysis for foodgrains:
4333 (Part I)-1977	Refractions
4333 (Part II)-1967	Moisture
4333 (Part III)-1967	Determination of hectolitre weight
4333 (Part IV)-1968	Weight of 1 000 grains
4333 (Part V)-1970	Determination of uric acid
4782-1968	Method for determination of sedimentation value of wheat (*Flour*)
4940-1968	Sample divider
5315-1978	Methods of sampling for milled cereals and pulses products (*first revision*)
6261-1971	Method of analysis for detection of insect and rodent contamination in grains and milled products
6894-1973	Malting barley
6895-1973	Barley malt
7462-1974	Improver wheat
7463-1974	Wheat flour for use by biscuit industry
7464-1974	Wheat flour for use in bread industry
8162-1976	Method for determination of wet gluten in wheat flour
8184-1976	Method for determination of ergot in foodgrains
8574-1977	Maize *SUJI* or *RAVA* (semolina)
9194-1979	Wheat flour for use by cake industry